

REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-9, 11-16, 18, 19, 21-24, 26, 27, and 30-34 are presently active. Claims 10, 17, 20, 25, 28, and 29 have been canceled without prejudice; Claims 1-9, 11-16, 18, 19, 21-24, 26, and 27 have been amended; and Claims 30-34 have been added by the present amendment. The changes and additions to the claims are supported by the originally filed specification and do not add new matter.

In the outstanding Office Action, Claims 6, 7, 12-14, 20, and 25-27 were objected to under 37 C.F.R. §1.75 as being multiple dependent claims dependent from other multiple dependent claims. In addition, Claims 28 and 29 were rejected under 35 U.S.C. §112, second paragraph, as being omnibus claims; Claims 1-5, 8-10, 15-18, and 22 were rejected under 35 U.S.C. §102(b) as being anticipated by Japanese Patent Publication No. 07-030888 to Hirabayashi (hereinafter "the '888 publication"); Claim 21 was rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,434,617 to Bianchi (hereinafter "the '617 patent"); Claims 23 and 24 were rejected under 35 U.S.C. §102(b) as being anticipated by Japanese Patent Publication No. JP405068241A to Fujino et al. (hereinafter "the '241 publication"); and Claims 11 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over the '888 and '241 publications.

Applicants wish to thank the Examiner for the personal interview granted Applicants' representatives on January 22, 2003, at which time proposed amendments to Claims 1, 8, and 15 were discussed and arguments in support of patentability were presented. However, no agreement was reached, pending the Examiner's further consideration of the claims upon formal submission of a response to the outstanding Office Action. During the interview, the

Examiner discussed his reading of the '888 publication in view of the claimed invention. Specifically, the Examiner indicated that the '888 publication discloses that, although background image pixels are set to zero, those pixels are not coded and transmitted. Rather, the Examiner reads the '888 publication to disclose that only the face/portrait pixels are coded and transmitted, which, in the Examiner's view, reads on the "fewer pixels" limitation and the "scaling" limitation recited in the claims. For the record, Applicants respectfully request clarification of the Examiner's reading of the '888 publication.

Regarding the objections to the claims under 37 C.F.R. §1.75, Claims 6, 7, 12, 14, 26, and 27 have been amended to no longer depend on another multiple dependent claim. Accordingly, the objection to those claims is believed to have been overcome. Moreover, Claims 20 and 25 have been canceled without prejudice herein, rendering the objection to those claims moot.

Applicants respectfully submit that the rejection of Claims 28 and 29 under 35 U.S.C. §112 is rendered moot by the cancellation of those claims herein.

Amended Claim 1 is directed to a method of processing a video image that includes an object of interest, comprising: (1) capturing a sequence of images having a first resolution in which the object of interest occupies a fraction of plural images of the sequence of captured images; (2) tracking the object of interest by selecting and extracting a region of each of the plural images that includes the object of interest; and (3) coding the selected region of each of the plural images. Moreover, Claim 1 has been amended to recite that *the extracted region of each of the plural images has a second resolution, smaller than the first resolution, corresponding to a display format of a receiving device.* The changes to Claim 1 are supported by the originally filed specification⁴ and do not add new matter.

⁴See, e.g., page 8 of the specification.

The '888 publication is directed to a moving image transmitter and a moving image receiver in which a camera 10 initially picks up a portrait on a background and stores the background in a memory 12. In addition, the '888 patent discloses an extraction circuit 14 that compares a stored picture in the background memory with an image obtained by the camera 10 to extract the non-background portion. Moreover, the '888 patent discloses that the pixels related to the non-extracted region of the camera image are set to zero. However, the '888 publication fails to disclose selecting and extracting a region of each of plural images of a sequence of captured images, *such that the extracted region of each of the plural images has a second resolution, smaller than a first resolution, corresponding to a display format of a receiving device*, as recited in amended Claim 1. Accordingly, Applicants respectfully submit that the rejection of Claim 1 (and dependent Claims 2-5) is rendered moot by the amendment to Claim 1 herein.

Amended Claim 8 is directed to a method of processing a video image captured by a camera, the video image including an object of interest, comprising: (1) selecting a region of an image including the object of interest, the selected region being of a predetermined size, and (2) coding the selected region. Moreover, Claim 8 has been amended to incorporate the limitation recited in original Claim 10, namely that the selected region corresponds to a display format having fewer pixels than the format of an image captured by the camera. Accordingly, the amendment to Claim 8 is supported by the originally filed specification and does not add new matter.

Regarding the rejection of original Claim 10, the Office Action refers to paragraphs 22-25 of the '888 publication. However, those paragraphs of the '888 publication are directed to the moving image *receiver*, and fail to indicate that the selected region of an image transmitted by the *transmitter* corresponds to a predetermined image format having

fewer pixels than the format of an image captured by the camera. Accordingly, Applicants respectfully traverse the rejection of Claim 8 as anticipated by the '888 publication.

Amended Claim 15 is directed to a method of processing a captured video image including an object of interest, comprising: (1) selecting a region of the captured image including the object of interest in which the selected region is greater than an area occupied by the object of interest by a predetermined degree *and the selected region has a first size*; (2) *scaling the selected region to a predetermined second size*; and (3) coding the selected region. Claim 15 has been amended to incorporate the limitation recited in original Claim 17. Accordingly, Claim 17 has been canceled without prejudice. Thus, the changes to Claim 15 are supported by the originally filed specification and do not add new matter.

Regarding the limitation recited in original Claim 17, Applicants respectfully submit that the '888 publication fails to disclose scaling a selected region to a predetermined second size, as recited in amended Claim 15. Accordingly Applicants respectfully traverse the rejection of Claim 15 (and dependent Claims 16, 18, and 19) as anticipated by the '888 publication.

Regarding Claim 22, that claim has been amended in a manner analogous to the amendment to Claim 1, namely to add the limitation that the extracted region has second resolution corresponding a display format of a receiving device. Accordingly, for the reasons stated above for the patentability of Claim 1, Applicants respectfully traverse the rejection of Claim 22 as anticipated by the '888 publication.

Regarding the rejection of Claim 21 as anticipated by the '617 patent, Claim 21 has been amended to recite limitations analogous to the limitations recited in amended Claim 1. The '617 patent is directed to an automatic tracking camera control system to track and display the location of a moving object. However, the '617 patent fails to disclose an

extracted region having a second resolution, smaller than the resolution of a captured image, corresponding to a display format of a receiving device, as recited in amended Claim 21.

Accordingly, Applicants respectfully traverse the rejection of Claim 21 as anticipated by the '617 patent.

Regarding the rejection of Claims 23 and 24 as anticipated by the '241 publication, Claims 23 and 24 have been amended to recite limitations analogous to the limitations recited in amended Claim 1. The '241 publication is directed to a method of tracking the location of a face within a display for use in a video telephone. However, the '241 publication fails to disclose a coding circuit configured to code a selected region in a second resolution, smaller than the resolution of the selected region, corresponding to a display format of a receiving device, as recited in amended Claims 23 and 24. Accordingly, Applicants respectfully traverse the rejection of Claims 23 and 24 as anticipated by the '241 publication.

Regarding the rejections of Claims 11 and 19 under 35 U.S.C. §103(a), Applicants respectfully submit that the '241 publication fails to remedy the deficiencies of the '888 publication with regard to independent Claims 8 and 15, as discussed above. Accordingly, Applicants respectfully submit that a *prima facie* case of obviousness has not been established and that the rejection of Claims 11 and 19 should be withdrawn.

The present amendment also sets forth new Claims 30-34 for examination on the merits. Claims 30-33 recite limitation combinations recited by original Claims 6 and 7, which were amended to be proper multiple-dependent claims. Thus, Claims 30-33 are supported by the originally filed specification and do not add new matter. New Claim 34 recites limitation combinations recited by original Claim 13, which was amended to be a proper multiple-dependent claim. Thus, Claim 13 is also supported by the originally filed specification and does not add new matter. Moreover, based on the asserted patentability of

Claims 1 and 8, as discussed above, Applicants submit that new Claims 34 patentably define over the '888 publication.

Thus, it is respectfully submitted that independent Claim 1 (and dependent Claims 2-7), independent Claim 8 (and dependent Claims 9 and 11-14), independent Claim 15 (and dependent Claims 16, 18, and 19), and independent Claims 21-24, 27, and 30-34 patentably define over the '888 publication, the '617 patent, and the '241 publication.

Consequently, in view of the present amendment and in light of the above discussions, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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IN THE SPECIFICATION

Page 1, before line 1, please insert:

--BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION--

Page 1, between lines 6 and 8, please insert:

--DISCUSSION OF THE BACKGROUND--

Page 2, lines 4-9, please replace the paragraph with the following:

--SUMMARY OF THE INVENTION

According to a first aspect of the present invention, the invention provides a method of transmitting a video image including an object of interest, comprising: capturing a sequence of images in which the object of interest occupies a fraction of each image, tracking the object of interest, and coding only the selected region of each captured image.--

Page 3, lines 4-7, please replace the paragraph with the following paragraph:

--According to a second aspect of the present invention, the invention provides a method of transmitting a video image including an object of interest, comprising: selecting a region of an image including the object of interest, the selected region being of a predetermined size, and coding the selected region.--

Page 3, line 21 to page 4, line 2, please replace the paragraph with the following paragraph:

--According to a third aspect of the present invention, the invention provides a method of transmitting a video image including an object of interest, comprising: selecting a region of the image greater than the object of interest by a predetermined degree, and coding said region.--

Page 5, before line 1, please insert the following:

--BRIEF DESCRIPTION OF THE DRAWINGS--

Page 5, between lines 13 and 15, please insert the following:

--DESCRIPTION OF THE PREFERRED EMBODIMENTS--

Page 5, line 19 to page 6, line 14, please replace the paragraph with the following paragraph:

--A mobile phone (not shown) includes a camera 2 for capturing images of the user. The camera 2 is a known type of camera for use in mobile video phones and is part of the phone handset. In an alternative embodiment, the camera is a separate component connected to the phone handset, for example, by a lead or by wireless communication. The camera [digitises] digitizes images at Common Interchange Format (CIF) resolution (352x288 pixels). The optical system of the camera is chosen so that in use the face of the user occupies approximately a predetermined fraction of the target image resolution, which is the resolution of the display 14. Here, the resolution of the display corresponds to Quarter Common Interchange Format (QCIF) format (176x144). In this embodiment, the optical system is configured so that in normal use the face occupies approximately 80% of the target resolution. Of course, the actual fraction of the image occupied by the face of the user will in use depend on various factors, such as the size of the face of the user and where the camera is actually held. Accordingly, the configuration of the camera including the focal length of the optical system is determined on the basis of statistical information representing, amongst

other things, the average size of people's faces, and what is considered a comfortable distance from the face for holding the camera.--

Page 6, line 16 to page 7, line 9, please replace the paragraph with the following text:

--The camera is connected to a signal processor 4 for processing signals received from the camera 2 representing the captured image. The signal processor 4 is shown in more detail in Fig. 2. The signal processor includes a face detection module 16, for detecting the size and position of the face or head in the captured image, a face tracking module 18, for tracking the fact as it moves in the image, a region selected circuit 20, for selecting a specific region of the image, and a face region extraction module 22. Face-detection circuits and face tracking circuits are known and described, for example in G. Burel and D. Carel, [-] "Detection and Localization of faces on digital images," Pattern Recognition Letters, 15:963-967, October 1994, and in Lars-Peter Bala, Kay Talimi and Jin Liu, [-] "Automatic Detection and Tracking of Faces and Facial Features in video Sequences," Picturing Coding Symposium 1997, 10-12, September 1997, Berlin, German, the contents of which are incorporated herein by reference. The signal processor 4 operates to select and extract a desired region of the image including the face region, as will be described in more detail below.--

IN THE CLAIMS

1. (Amended) A method of [transmitting] processing a video image [including] that includes an object of interest, comprising:

capturing a sequence of images having a first resolution, in which the object of interest occupies a fraction of [each image,] plural images of the sequence of captured images;

tracking the object of interest by selecting and extracting a region of each of the plural images [including] that includes the object of interest[,]; and

coding [only] the [selected] extracted region of each [captured image] of the plural images.

wherein the extracted region of each of the plural images has a second resolution, smaller than the first resolution, corresponding to a display format of a receiving device.

2. (Amended) [A] The method [as claimed in] of claim 1, further comprising: [stabilising] stabilizing the object of interest within the extracted region.

3. (Amended) [A] The method [as claimed in] of claim 2, wherein the extracted region is selected so that the object of interest is [centred] centered within the extracted region.

4. (Amended) [A] The method [as claimed in] of any one of claims 1 to 3, further comprising:

transmitting the coded extracted region[,]; and

decoding and displaying the [selected] coded extracted region.

5. (Amended) [A] The method [as claimed in] of claim 4, wherein the extracted region is displayed in a format comprising fewer pixels than [the] a format of each of the plural images of the sequence of captured[image] images.

6. (Amended) [A] The method [as claimed in] of any one of claims 1 to [5 in which] 3, wherein the object of interest occupies less than a predetermined fraction of each image.

7. (Amended) [A] The method [as claimed in] of any one of claims 1 to [5 in which] 3, wherein the object of interest occupies a small fraction of each image.

8. (Amended) A method of processing a video image captured by a camera, the video image including an object of interest, comprising:

selecting a region of an image including the object of interest, the selected region being of a predetermined size[,]; and

coding the selected region, wherein the selected region corresponds to a display format having fewer pixels than the format of an image captured by the camera.

9. (Amended) [A] The method [as claimed in] of claim 8, wherein [only] the selected region is coded and [the rest] a non-selected region of the captured image is discarded.

10. (Canceled)

11. (Amended) [A] The method [as claimed in] of claim [10]8, wherein the captured image is in Common Interchange Format (CIF) [CIF] format and the selected region is in [QCIF] Quarter Common Interchange Format (QCIF) [format].

12. (Amended) [A] The method [as claimed in] of any one of claims 8, [to 11] 9, or 11, wherein the selected region is scaled to compensate for movements of the object of interest backwards and forwards relative to the camera.

13. (Amended) [A] The method [as claimed in] of any of claims 8, [to 12] 9, or 11, wherein the object of interest is [stabilised] stabilized within the selected region.

14. (Amended) [A] The method [as claimed in] of claim 13, wherein the selected region is selected such [so] that the object of interest is [centred] centered in the selected region.

15. (Amended) A method of processing a captured video image including an object of interest, comprising:

selecting a region of the captured image including the object of interest [and] in which the selected region is greater than [the] an area occupied by the object of interest by a predetermined degree[,], and the selected region has a first size;

scaling the selected region to a predetermined second size; and

coding [said] the selected region.

16. (Amended) [A] The method [as claimed in] of claim 15, wherein the object of interest occupies a predetermined percentage of the selected region.

17. (Canceled)

18. (Amended) [A] The method [as claimed in] of claim [17] 15, wherein the predetermined second size corresponds to a known display format.

19. (Amended) [A] The method [as claimed in] of claim 18, wherein the captured image is in CIF format and the [extracted] selected region is scaled to QCIF format.

20. (Canceled)

21. (Amended) A method of operating a video camera, comprising:
arranging the video camera so that an object of interest occupies a fraction of [the] an area of [the] a captured image[,]
having a first resolution;

tracking movement of the object of interest within the captured image[,];

selecting and extracting a region of interest around the object of interest; and

displaying only the extracted [part] region of the captured image.

wherein the extracted region has a second resolution, smaller than the first resolution,
corresponding to a display format of a receiving device.

22. (Amended) An image processing circuit, comprising:

means for extracting a region of [each] plural captured images having a first resolution including an object of interest; and

a coding circuit configured to code [coding only] the [selected] extracted region of each of the plural captured images, wherein the extracted region has a second resolution, smaller than the first resolution, corresponding to a display format of a receiving device.

23. (Amended) An image processing circuit, comprising:

means for selecting a region of an image having a first resolution including an object of interest, the selected region [being of] having a predetermined size[,]; and

a coding circuit configured to code [coding] the selected region in a second resolution, smaller than the first resolution, corresponding to a display format of a receiving device.

24. (Amended) An image processing circuit, comprising:

means for selecting a region of [the] an image having a first resolution such that [the] an object of interest occupies a predetermined percentage of the selected region[,]; and

means for coding said selected region in a second resolution, smaller than the first resolution, corresponding to a display format of a receiving device.

25. (Canceled)

26. (Amended) A video image processing device comprising a camera and [a] the image processing circuit as claimed in any one of claims [21 to 25] 22 to 24.

27. (Amended) A mobile phone comprising [a] the image processing circuit as claimed in any one of claims [21 to 25] 22 to 24 [or a device as claimed in claim 26].

28. (Canceled)

29. (Canceled)

30-34. (New)

IN THE ABSTRACT

Please amend the Abstract on page 20 as shown below.

--[Method and apparatus for transmitting a video image]

[Abstract] ABSTRACT

A method of transmitting a video image including an object of interest [comprises] comprising capturing a sequence of images in which the object of interest occupies a fraction of each image, tracking the object of interest by selecting and extracting a region of each image including the object of interest, and coding [only] the selected region of each captured image.

[Fig. 1]--